

Edgewater BESS Project

Appendix N – Decommissioning Plan

**Decommissioning Plan
Edgewater Battery Energy Storage
System Project
Sheboygan, Wisconsin**



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Project No: 193709357
January 05, 2023

DECOMMISSIONING PLAN

EDGEWATER BATTERY ENERGY STORAGE SYSTEM PROJECT, SHEBOYGAN, WISCONSIN

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1.0 INTRODUCTION

Wisconsin Power and Light Company (WPL) is proposing to construct the Edgewater Battery Energy Storage System Project (the Project) in the City of Sheboygan, Sheboygan County, Wisconsin.

The proposed Project is located adjacent to the Edgewater Generating Station in the City of Sheboygan, Wisconsin. The Project facilities encompass approximately 5.5 acres of land within perimeter fencing. The rated power capacity of the Project will be 99 megawatts (MW) alternating current [AC], with a 396 MW-Hour (MWh) energy storage capacity. Major components of the Project include battery energy storage systems, inverter/transformer power conversion systems, fire suppression systems, and associated structures and foundations.

The Edgewater BESS has a projected Commercial Operation Date in of 2025. This Decommissioning Plan (Plan) provides a description of the decommissioning and restoration phase of the Project. The decommissioning phase is assumed to include the removal of Project facilities as listed in Section 1.1 and shown in Figure 1.

This Plan provides an overview of the primary decommissioning Project activities, including the dismantling and removal of facilities, and subsequent restoration of land. A summary of estimated costs associated with decommissioning the Project is provided in Section 4.0. Summary statistics and estimated costs are provided assuming a 99-MW_[AC], 396 MWh Project design.

1.1 BATTERY STORAGE FACILITY COMPONENTS

The main components of the Project include:

- Battery energy storage system (BESS)
- Inverter and transformer stations
- Site and internal access areas
- Foundation pads and footings for equipment
- Electrical cabling and conduits
- Perimeter fencing
- Permanent stormwater basin

1.2 TRIGGERING EVENTS AND EXPECTED LIFETIME OF PROJECT

Project decommissioning may be triggered by an event such as the end of a contract or power purchase agreement. Typically, a Project will be considered to be abandoned if the Project is non-operational for a period of twelve (12) consecutive months. If properly maintained, the expected lifetime of a utility-scale BESS project is 15-20 years or greater with an opportunity for an extended project lifetime with equipment replacement or augmentation.

The battery units will be shipped to a recycling facility, as described further in Section 2.2. Other components of the BESS facility with resale value may be sold in the wholesale market. Components with no wholesale value will be salvaged and sold as scrap for recycling or disposed of at an approved offsite

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licensed solid waste disposal facility (landfill). Decommissioning activities will include removal of the BESS and associated components as listed in Section 1.1 and described in Section 2.

1.3 DECOMMISSIONING SEQUENCE

Decommissioning activities of BESS projects typically begin within 12 months of the project ceasing operation and are anticipated to be completed within 6 months of start of decommissioning. Monitoring and site restoration may extend beyond this period to ensure successful revegetation and rehabilitation. WPL will be the responsible party for Project decommissioning. The anticipated sequence of decommissioning and removal is described below; however, overlap of activities is expected and will be determined by the chosen decommissioning contractor.

- Reinforce access and internal areas, if needed, and prepare site for component removal
- Install temporary fencing and best management practices (BMPs) to protect sensitive resources and control erosion during decommissioning activities
- De-energize BESS
- Remove integrated battery storage units
- Remove power conversion systems (inverter/transformer stations)
- Remove support piers and foundations
- Remove electrical cables and conduits (less than three feet in depth)
- Remove perimeter fencing
- Fill stormwater basins and remove associated infrastructure
- Remove external and internal access areas and grade site
- De-compact subsoils (if required), restore and revegetate disturbed land to pre-construction land use to the extent practicable

2.0 PROJECT COMPONENTS AND DECOMMISSIONING ACTIVITIES

The BESS facility components and decommissioning activities necessary to restore the Project area, as near as practicable, to allow pre-construction land use, are described within this section.

2.1 OVERVIEW OF BATTERY ENERGY STORAGE FACILITY SYSTEM

WPL anticipates utilizing approximately 1,184 self-contained battery storage units with a total energy storage capacity of approximately 396 MWh. The foundations include area for additional future augmentation of 224 battery storage units. The Project area, including the permanent stormwater basins, encompasses approximately 5.5 acres. Prior to construction, land use within the BESS area was predominantly open grassland. Statistics and estimates provided in this Plan are based on the Golden Sigma battery storage units manufactured by SYL Battery.

Collection cabling will be installed below the surface at an approximate depth of 36 to 48 inches (three to four feet). Foundations, electric cabling, and conduit below the soil surface will be removed to a minimum depth of 36 inches. Public roads damaged or modified during the decommissioning and reclamation process will be repaired upon completion of the decommissioning phase.

Estimated quantities of materials to be removed and salvaged or disposed of are included in this section. Some of the materials described will have salvage value; although there are also some components that will likely have none at the time of decommissioning. All materials will be salvaged or recycled to the extent possible. All other waste materials will be disposed of in accordance with state and federal law at a licensed solid waste facility. If decommissioned prior to the end of their useful life, the battery packs may have value in a resale market, depending on their condition.

Table 1 presents a summary of the primary components of the Project included in this decommissioning plan.

Table 1 Primary Components of BESS Facility to be Decommissioned

Component	Quantity	Unit of Measure
Golden Sigma Battery Storage Units with Integrated Ventilation and Fire Suppression	1,184	Each
BESS Blocks and Foundations	64	Units
Power Conversion Stations (Inverter/Transformers)	32	Each
Electrical Cables and Conduits (below ground cabling greater than 36 inches in depth will be abandoned)	6,292	Lineal Foot (estimated)
Gravel pad (aggregate base-fill within fenceline)	5.5	Acres (approximate)
Perimeter Fencing	2,940	Lineal Foot (approximate)
Permanent Stormwater Basins (totaling approximately 0.5 acres)	2	Each

2.2 BESS BATTERY UNITS AND SUPPORT STRUCTURES

The Project includes 1,184 battery energy storage units, each with integrated fire suppression and ventilation. The system will provide 99 MW_[AC] of rated power capacity and 396 MWh of energy storage capacity. Statistics and estimates provided in this Plan are based on a SYL Battery's (SYL) 340.48 kWh Golden Sigma Battery Energy Storage System. Eighteen (18) to nineteen (19) battery units will be grouped together on each concrete pad foundation. Each foundation will include areas for three to four additional battery units (augmentation bays). The units are mainly comprised of materials such as Lithium-ion (Li-ion) batteries, steel, copper, plastic, and epoxies. If decommissioned prior to the end of their useful life, the battery packs will likely have value in a resale market, depending on their condition.

Thirty-two (32) power conversion systems (inverter and transformer units) will be located adjacent to the BESS container units on skid assemblies mounted on steel reinforced concrete foundations or piles. The inverter/transformer stations and associated equipment will be deactivated, disassembled, and removed at decommissioning. Depending on condition, the inverter/transformer systems may be sold for refurbishment and re-use. Collection cabling will be installed below the surface at a depth of 36 inches (three feet) or greater. All above ground facilities and subsurface materials located less than three feet in depth will be removed and salvaged or disposed of in accordance with state and federal law at a licensed solid waste facility.

At the time of decommissioning the BESS and container units will be completely removed from the Project site. Unlike some BESS manufacturers, SYL does not currently have a program that accepts the responsibility of battery system disposal and recycling. Therefore, the cost of battery recycling, in addition to removal and shipping costs of the batteries, will be borne by the Project.

Battery packs may have value for reuse if decommissioned during the early stages of Project operation; however, the resale or salvage value is difficult to predict and will be dependent on the age of the batteries at that time. Recovery programs to extract valuable materials such as nickel, cobalt, copper, aluminum, steel, and lithium from the systems are expanding and improving at a rapid rate. A conservative cost to cover shipping and recycling of the used batteries is included in the BESS decommissioning cost estimate (Table 2).

The BESS concrete foundations and gravel pad will be removed and recycled or properly disposed of. The BESS site will be graded and restored to pre-construction condition, to the extent practicable.

2.3 ELECTRICAL CABLING AND CONDUITS

The Project's underground electrical collection system will be placed at a depth of 36 to 48 inches (three to four feet). The Plan assumes that electrical cabling located below the ground surface at 36 inches or deeper will be abandoned in place.

2.4 PERMANENT STORMWATER BASIN

The Project includes two permanent stormwater detention basins adjacent to the BESS facilities. The detention basins will total approximately 0.5 acre in size and will be removed at the end of the Project operational period. The basins will be filled with clean fill, finished with topsoil, and graded to restore pre-construction drainage patterns to the extent practicable.

2.5 PERIMETER FENCING, SITE ACCESS AND INTERNAL ROADS

The Project will include a security fence around the perimeter of BESS area. The perimeter fence will be completely removed from the Project site during decommissioning. The BESS area contains aggregate fill approximately eight inches in depth, with the exception of the concrete foundations. An external access drive will provide direct access to the BESS facility from a public road. The gravel pad within the facility will provide access to the internal equipment.

Decommissioning activities include the removal and stockpiling of aggregate materials onsite for salvage preparation. Underlying geotextile fabric, where present, will also be removed during the decommissioning process. Fabric that is easily separated from the aggregate during excavation will be disposed of in an approved solid waste disposal facility. Fabric that remains with the aggregate will be sorted out at the processing site and properly disposed of. Following removal of aggregate and geotextile fabric, the disturbed areas will be graded, de-compacted, back-filled with native subsoil and topsoil, as needed, and land use restored as near as practicable to preconstruction conditions.

3.0 LAND USE AND ENVIRONMENT

3.1 SOILS AND PREVIOUS LAND USE

The proposed solar facility is located on land currently vacant utilized for industrial purposes. Land disturbed by Project facilities will be restored in such a way as to be used in a reasonably similar manner to its original intended use as it existed prior to Project construction.

3.2 RESTORATION AND REVEGETATION

Project sites that have been excavated and backfilled will be graded as previously described to restore land as required by the regulatory commitments. Soils compacted during de-commissioning activities will be de-compacted, as necessary, to restore the land to preconstruction land use. Topsoil will be placed on disturbed areas, as needed, and seeded with appropriate vegetation. Work will be completed to comply with the conditions agreed upon by WPL and the City of Sheboygan, or as directed by other federal, state, and local regulations in effect at the time of decommissioning

3.3 SURFACE WATER DRAINAGE AND CONTROL

Surface water conditions at the Project site will be reassessed prior to the decommissioning phase. WPL will obtain the required water quality permits, if needed, before decommissioning of the Project. Construction stormwater permits will also be obtained, and an Erosion Control and Stormwater Management Plan will be prepared describing the protection needed to reflect conditions present at that time. BMPs may include: construction entrances, temporary seeding, permanent seeding, mulching (in non-agricultural areas), erosion control matting, silt fence, filter berms, and filter socks.

3.4 MAJOR EQUIPMENT REQUIRED FOR DECOMMISSIONING

The activities involved in decommissioning the Project include removal of the above and below-ground components of the Project and restoration as described in Sections 2 and 3.2.

Equipment required for the decommissioning activities is similar to what is needed to construct the BESS facility and may include, but is not limited to: small cranes, low ground pressure (LGP) track mounted excavators, backhoes, LGP track bulldozers, LGP off-road end-dump trucks, front-end loaders, water trucks, disc plows and/or tractors, and ancillary equipment. Standard dump trucks may be used to transport material removed from the site to disposal facilities.

4.0 DECOMMISSIONING COST ESTIMATE SUMMARY

Expenses associated with decommissioning the Project will be dependent on labor costs at the time of decommissioning. For the purposes of this report, approximate 2022 average market values were used to estimate labor expenses. Fluctuation and inflation of the labor costs were not factored into the estimates.

4.1 DECOMMISSIONING EXPENSES

Project decommissioning will incur costs associated with removal of facilities and disposal of components not recycled or sold for salvage, including materials which will be disposed of at a licensed facility, as required. Decommissioning costs also include backfilling, grading and restoration of the proposed Project site as described in Section 2. Table 2 summarizes the estimates for activities associated with the major components of the Project.

Table 2 Estimated Decommissioning Expenses

Activity	Unit	Quantity	Cost per Unit	Total
Overhead and management	Lump Sum	1	\$114,000	\$114,000
Battery pack and container removal	Each	1,184	\$382	\$452,288
Battery pack foundation removal	Each	64	\$5,126	\$328,064
Inverter/transformer stations with foundations	Each	32	\$2,430	\$77,760
Permanent stormwater basin removal	Lump Sum	1	\$38,605	\$38,605
Perimeter fence removal	Linear Feet	2,940	\$3.90	\$11,466
BESS yard removal	Lump Sum	1	\$81,750	\$81,750
Site restoration (remove fill, grading and revegetation)	Lump Sum	1	\$146,100	\$146,100
Total estimated cost for removal BESS facilities and site restoration				\$1,250,033
Total estimated cost for packaging and shipping batteries to recycling facilities				\$2,562,100
Total estimated cost to recycle batteries				\$6,889,600
Total estimated cost to decommission and recycle BESS facilities				\$10,701,733

4.2 DECOMMISSIONING REVENUES

Depending on market conditions and the age and condition of the facilities at time of decommissioning, there may be resale or salvage value in the components. No revenue from decommissioning the Project has been considered in this Plan.

4.3 DECOMMISSIONING COST SUMMARY

Table 3 provides a summary of the estimated cost to decommission the Project, using the information detailed in Sections 4.1. Estimates are based on 2022 prices, with no resale or salvage revenue, market fluctuations or inflation considered.

Table 3 Decommissioning Cost Summary

Description	Cost
Decommissioning Expenses for Facility Removal and Restoration	\$1,250,033
Handling and Transportation Cost of Battery Pack Units to Recycling Facility	\$2,562,100
Recycling Cost of BESS Battery Components	\$6,889,600
Total Decommissioning Cost Including Transportation and Battery Recycling Charges	\$10,701,733

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Figure 1 Proposed Project Layout

